

2007 Pupil Yield Study – Final Report

Frederick County, Maryland

Prepared by
The Frederick County Division of Planning
Frederick County Public Schools Facilities Services Division

INTRODUCTION

In 2005 both the Board of County Commissioners and Board of Education identified the need to update the pupil yield factors of public school students living in Frederick County housing. Prior to 2005, the last such study was completed in 1998 and the results have been utilized by the County in determining the impacts of new development with respect to the capacity of the affected school(s). With changes in demographics and housing stock, housing affordability issues, and levels of housing starts, it had been suggested that changes in the student yields from certain types of housing may have changed since the last study.

To that end, the Frederick County Division of Planning along with the Frederick County Public Schools Facilities Services Division collaborated to prepare a Comprehensive Pupil Yield Study in 2005. It was agreed that this study would be completed every two years to continue to refine the pupil yields as well as provide a basis for understanding any trends that may be occurring. To that end, this report provides the results of the 2007 Pupil Yield Study for Frederick County Public Schools.

The report is organized into five chapters. Chapter 1 presents the methodology and key steps used by FCPS staff for the student survey, as well as the Planning Division staff's efforts in generating housing totals by type of unit for each school district and ultimately the resulting factors themselves. Chapter 2 provides background information on school, housing, and demographic data. Chapter 3 presents summary data of the 2007 Pupil Yield Factors. Chapter 4 describes some of the key findings and comparative analysis with the 1998 and 2005 Factors and future actions. Chapter 5 provides the 2007 Pupil Yield Study Rates by individual schools; a copy of the 2005 results; and a copy of the 2007 Survey Instrument.

CHAPTER 1 – METHODOLOGY

The following presents the methodology and key steps used by Frederick County Public Schools staff for the student survey, as well as the Division of Planning staff's efforts in generating housing totals by type of unit for each school district and ultimately the resulting factors themselves.

Student Survey – Pupils By Type of Housing

Each year, a Student Information Card is completed for each student enrolled in a Frederick County Public School. The Student Information Card includes information about the student's address, parental/guardian, childcare, special health needs and emergency contact. This year, an additional question was added to the Student Information Card. Each student was asked if they lived in a single-family house, town house or multi family dwelling.

The Student Information Card was completed and returned to the student's school in September 2007 by the parent or guardian. Administrative specialists at each school were responsible for entering the data from the Cards into the student data system called Pentamation.

By January 2008, FCPS had completed the data collection. The response rate at all levels averaged 96%, with no individual school less than 77%. The average response rate was 94% at the elementary level, 97% at the middle schools and 97% at the high schools. By contrast, the 1998 study resulted in a response rate of approximately 52% and in 2005 the response rate was 92% overall. Once the responses were tabulated by housing type for each school, the percentage of responses by housing type was applied to the total enrollment for each school to determine the total number of students by housing type for each school.

Housing Data Totals – Housing Units By Type and School District

The first step that the Planning Division undertook was the creation of the housing unit inventory by type of housing (i.e. single-family, townhouse, multi-family). Staff utilized year 2000 orthophotography in order to locate and classify the housing unit types in the County for those areas outside of the incorporated municipalities. An initial determination of the housing units were inventoried and classified by type using the Maryland Tax Assessment records or by interpretation of the orthophotography.

As stated previously the Planning Division did not include municipalities in the countywide housing unit inventory utilizing the orthophotographic and MD Tax Assessment records. To provide a greater level of accuracy, it was decided that staff would utilize the block level geography from the 2000 US Census to obtain the housing units by type for each municipality.

Once the 2000 Census housing units were calculated we did update this information with the geo-coded issued housing unit permits to obtain more recent data.

Once this process was complete the Planning Division utilized geo-coded issued housing unit permits from January 1st, 2000 to December 31st, 2006 to locate new housing construction.

The cut-off date of December 2006 for permit data for the Pupil Generation for September 2007 is a reasonable date due to the fact that the December 2006 permits are those that are issued for construction in December 2006. With anywhere from a 4-9 month timeframe for construction it was a reasonable assumption that permits issued after December 2006 would not necessarily be ready for occupancy in September 2007. Although an argument could be made that the resulting factors are too high because there are actually more homes on the ground and ready for occupancy by the fall than what is anticipated due to some homes issued in January, February, and even March providing for occupancy on the fall. Furthermore, utilizing an end of year date will

provide some consistency in future surveys and is a reasonable assumption for the purpose of this type of study.

Once a complete up-to-date housing unit inventory was developed staff utilized the County's GIS to select the housing units that were within the boundaries of each Elementary, Middle, and High School District. The totals were calculated and the types were queried, providing the number of housing units, by type in each school district.

Pupil Yield Factors

Generating the pupil yield factors is a simple calculation. The Pupil's by type of housing was divided by the housing unit by type for each school district in order to determine the resulting pupil yield factor for each school.

Cumulative results indicate factors for each school level as well as for the housing unit types.

<p>Pupils By Type of Housing and School District</p> <hr/> <p>Housing Units By Type and School District</p>

CHAPTER 2 – BACKGROUND DATA

As of September 2007, The Frederick County Public School system operates 58 schools including 36 elementary, 13 middle school, and 9 high schools. Student Enrollment in the elementary schools totaled 17,984 in the middle schools 9,179 students, and in the high schools 12,763 students totaling 39,926 public school students countywide. These pupil totals, for the purposes of this study, do not include the three special schools, Rock Creek; Heather Ridge; and the Evening High School and the approximately 350 total students enrolled at those schools. Nor does it include the approximately 250 students attending the Monocacy Valley Montessori School.

Population Trends and Estimates

As of September 2007 there were approximately 228,000 persons within the County. A comparison of prior census figures and Frederick County Public School populations are represented in the table below.

DATA	1970	1980	1990	2000	2005
General Population	84,927	114,792	150,208	195,277	225,000
School Aged Population	25,388	30,152	32,332	44,629	50,767
Public School Student Population	19,389	23,459	26,875	36,961	39,137

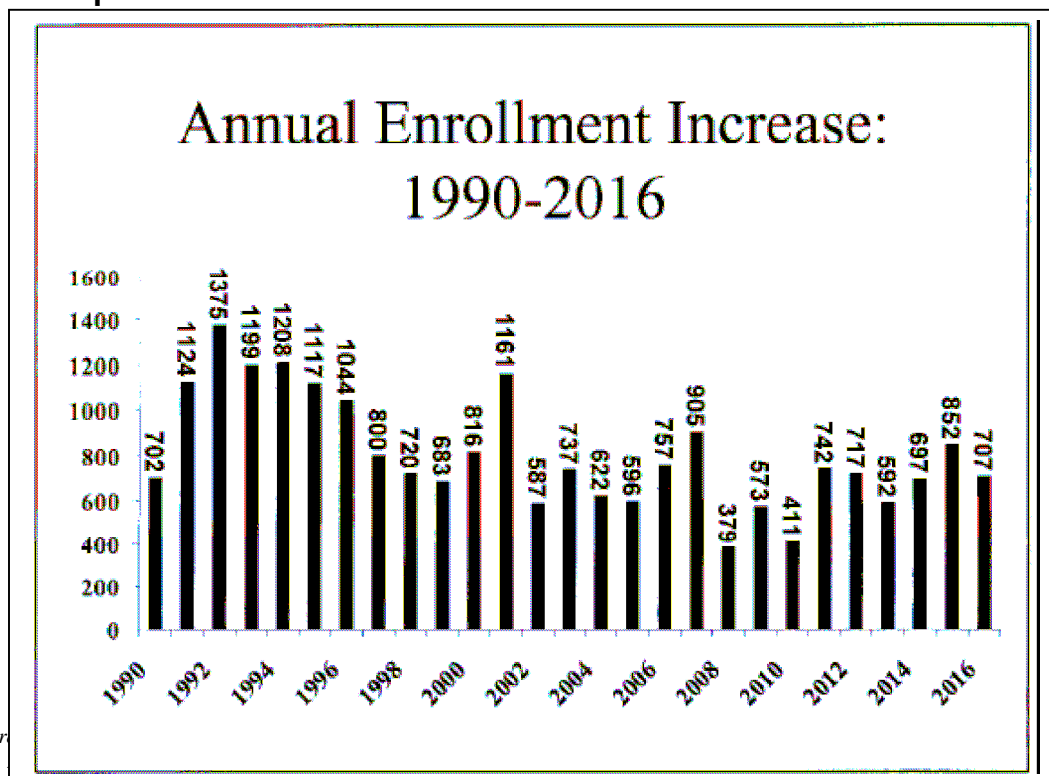
Source: Frederick County Division of Planning, U.S. Census, FCPS Educational Facilities Master Plan

The following tables provide historical information on Housing Construction Trends and Annual Enrollment Increases.

Housing Construction Trends

Calendar Year	Total Dwelling Units	Single Family Detached	Single Family Attached	Mobile Homes	Multi-Family
2007	1,054	583	246	7	218
2006	1,284	811	192	10	271
2005	2,251	989	425	9	828
2004	1,570	903	490	16	161
2003	1,924	1,079	554	15	276
10 Year Avg.	1,940	1,123	473	11	334
20 Year Avg.	1,984	1,145	498	12	328
30 Year Avg.	1,848	1,050	439	17	343

Annual September Enrollment Increase



CHAPTER 3 – SUMMARY DATA

The table below indicates the overall pupil yield rates generated from the 2007 Study. The table is broken down to depict the number of public school students generated by different types of housing units. For the purposes of this study, single-family detached dwellings includes mobile homes; single-family attached include town homes and duplex dwellings; and multi-family dwellings include condominiums and apartment units.

2007 Pupil Yield Survey Results

Dwelling Type	Elementary School	Middle School	High School	All Grades
Single Family Detached	.23	.13	.18	.54
Single Family Attached	.24	.10	.13	.47
Multi-Family	.05	.02	.02	.09
All Dwellings	.21	.11	.15	.46

As indicated, a single-family detached unit would generate .23 Elementary School students or for example, a 100 unit single family subdivision would generate the following: 23 public elementary students, 13 public middle school students; and 18 public high school students for a total of 54 public school students.

CHAPTER 4 – COMPARATIVE ANALYSIS/KEY ISSUES

Comparison table of the 1998, 2005 and 2007 study results

Dwelling Type	Survey Year	Elementary School	Middle School	High School	All Grades
Single Family Detached	1998	.23	.14	.18	.56
	2005	.24	.13	.18	.56
	2007	.23	.13	.18	.54
Single Family Attached	1998	.20	.08	.09	.37
	2005	.24	.10	.13	.47
	2007	.24	.10	.13	.47
Multi-Family	1998	.06	.02	.02	.10
	2005	.05	.02	.02	.09
	2007	.05	.02	.02	.09
All Dwellings	1998	.20	.11	.14	.45
	2005	.21	.11	.15	.48
	2007	.21	.11	.15	.46

Key Findings

As indicated in the table above, no significant changes occurred in the survey results between 2005 and 2007. The only statistical change was seen at the elementary school level for single-family detached, wherein it dropped by (.01) to actually fall slightly below the rate of a single-family attached. The single-family attached continue to maintain the overall increase identified in the 2005 study.

Data Anomalies

With any type of survey or statistical measure there are anomalies that occur. After reviewing the results staff noticed that a few pupil yield factors that were not consistent with the overall results. There are undoubtedly a number of reasons, with their cumulative effects, that cause the factors to be skewed in such a manner. The inconsistent results could simply occur because the respondent marked the wrong box altogether or the housing data could be off in that particular location. Due to the small number of respondents for a particular category or the estimated number of housing units by type for these anomalies, a small error on either end (the respondent or the housing unit assumption) will result in such varied results.

However, the Board of Education staff reviewed these identified areas and provided some possible causes, such as programmatic and out-of-district enrollments. In some cases the staff identified that the school(s) having a disproportionate large yield factor had a special educational program (Gifted and Talented, The Challenge Program, SET Program) that draws students from other parts of the county. As noted, there may be a variety of issues affecting the individual schools. However, we should not lose sight of the fact that we have achieved an overall survey response rate of 96% and the identified anomalies should not statistically alter the overall pupil yield factors. Where the pupil yield factor for a specific school is inconsistent, the Frederick County Public Schools would utilize the overall countywide numbers, as they have done in the past. These adjustments are reflected in the summary table,

How Frederick County Ranks Statewide

The table below indicates the 2004 Pupil Yield Rates for Maryland Counties and Baltimore City. The information was derived from MD Office of Planning 2004 Pupil Generation and U.S. Census Bureau July 2004 Housing Estimates. The 0.46 overall pupil yield factor is consistent with the results of our study. Frederick County, along with the other first tier suburban counties have a higher than statewide average pupil yield factor. As an aside, a national study undertaken by the National Multi Housing Council 2002 indicated that the national average was 0.48 children per household (106.4 million households and 51.1 million school-age children).

<u>Geographic Area</u>	<u>Pupil Yield Rate</u>
Worcester County	0.13
Allegany County	0.20
Kent County	0.22
Talbot County	0.24
Garrett County	0.26
Somerset County	0.27
Baltimore City	0.30
Dorchester County	0.30
Baltimore County	0.33
Washington County	0.35
Anne Arundel County	0.37
Wicomico County	0.37
Maryland State Average	0.38
Montgomery County	0.39
Queen Anne's County	0.40
Caroline County	0.41
St. Mary's County	0.42
Cecil County	0.42
Prince George's County	0.43
Harford County	0.44
Frederick County	0.46
Howard County	0.48
Carroll County	0.48
Charles County	0.52
Calvert County	0.56

Future Action

As identified following the 2005 study, the issue of increased approval and construction of age-restricted housing in the County was discussed. Today, the County still has very little age-restricted housing 'on the ground' (due to the economic conditions) that would affect the results. However, with the increased number of age-restricted housing units pending or that have received approvals, within the past few years continuing to utilize these total units in the total housing units will dilute, to some degree, the overall pupil yield factors. Since age-restricted housing is intended by law to not house any school aged children, those units should, in the future, not be counted in the overall housing unit totals for the purpose of this study.

It is recommended that this study continue to be performed at least every other year to enable the County to track changes in pupil yield factors and to identify if the changes in demographics and housing stock, and levels of housing starts, have an effect on the student yields.

Lastly, Section § 1-20-61 of the Frederick County Code provides provisions for the determination of adequacy, and specifically, § 1-20-61 (3) states:

Pupil generation rates shall be determined using the formulas adopted by the Frederick County Public Schools and shall reflect the characteristics of the school attendance area within which the proposed development is located. Pupil yield from the proposed development shall be pro- rated over the number of years for which APFO approval is sought. State rated capacities and pupil generation rates approved for use by the Frederick County Public Schools shall be used in all calculations.

It is the intention of the FCPS staff to utilize these new factors for all future APFO tests and to calculate future pupil needs associated with the County CIP and County Plan Update process.

CHAPTER 5 – APPENDIX

Included in the Appendix are the following:

- 2007 Pupil Yield Study Summary Data
- 2005 Pupil Yield Study Summary Data
- Excerpt Sample of the FCPS 2007 Survey Instrument

**Frederick County Public Schools Pupils Per Household
(As of September 2007)**

<i>FCPS 2007 Pupil Yield Rates</i>	Single-Family Detached + Mobile Homes	Two-Family Duplex or Townhouse	Multi- Family	Totals
ELEMENTARY SCHOOL				
Ballenger Cr ES	0.35	0.20	0.05	0.20
Brunswick ES	0.19	0.21	0.04	0.18
Carroll Manor ES	0.27	0.24	0.05	0.29
Centerville ES	0.44	0.17	0.03	0.37
Deer Crossing ES	0.34	0.19	0.07	0.31
Emmitsburg ES	0.17	0.18	0.05	0.15
Glade ES	0.27	0.72	0.03	0.30
Green Valley ES	0.24	0.24	0.05	0.24
Hillcrest ES	0.19	0.40	0.08	0.21
Kempton ES	0.28	0.24	0.05	0.28
Lewistown ES	0.16	0.24	0.05	0.18
Liberty ES	0.17	0.24	0.08	0.18
Lincoln ES	0.08	0.14	0.04	0.08
<i>Middletown ES and PS Total</i>	<i>0.25</i>	<i>0.16</i>	<i>0.06</i>	<i>0.23</i>
Monocacy ES	0.32	0.42	0.09	0.30
Myersville ES	0.20	0.24	0.04	0.19
New Market ES	0.26	0.29	0.05	0.26
New Midway/Woodsboro ES	0.17	0.24	0.16	0.18
North Frederick ES	0.23	0.09	0.04	0.12
Oakdale ES	0.27	0.13	0.05	0.25
Orchard Grove ES	0.31	0.32	0.06	0.23
Parkway ES	0.21	0.09	0.02	0.10
Sabillasville ES	0.13	0.24	0.03	0.13
Spring Ridge ES	0.19	0.24	0.02	0.15
<i>Thumont ES and PS Total</i>	<i>0.21</i>	<i>0.28</i>	<i>0.03</i>	<i>0.19</i>
Tuscarora ES	0.23	0.27	0.08	0.23
Twin Ridge ES	0.30	0.11	0.08	0.27
Urbana ES	0.30	0.30	0.05	0.30
Valley ES	0.22	0.34	0.03	0.22
Walkersville ES	0.14	0.19	0.01	0.14
Waverley ES	0.20	0.13	0.20	0.19
Whittier ES	0.27	0.46	0.04	0.26
Wolfsville ES	0.16	0.24	0.05	0.16
Yellow Spring ES	0.20	0.24	0.05	0.22
Countywide Average	0.233	0.244	0.054	0.208

MIDDLE SCHOOL				
Ballenger Cr MS	0.16	0.14	0.02	0.13
Brunswick MS	0.12	0.10	0.03	0.11
Crestwood MS	0.13	0.10	0.02	0.09
Gov TJ MS	0.11	0.07	0.01	0.07
Middletown MS	0.12	0.11	0.02	0.12
Monocacy MS	0.11	0.12	0.04	0.10
New Market MS	0.14	0.08	0.04	0.13
Oakdale MS	0.15	0.11	0.03	0.15
Thurmont MS	0.10	0.06	0.01	0.08
Urbana MS	0.15	0.10	0.02	0.14
Walkersville MS	0.13	0.10	0.01	0.11
West Frederick MS	0.11	0.11	0.02	0.08
Windsor Knolls MS	0.17	0.10	0.02	0.17
Countywide Average	0.128	0.101	0.017	0.106

HIGH SCHOOL				
Brunswick HS	0.16	0.17	0.03	0.15
Catoctin HS	0.14	0.09	0.02	0.12
Frederick HS	0.18	0.13	0.02	0.11
Gov TJ HS	0.16	0.12	0.02	0.12
Linganore HS	0.21	0.11	0.02	0.19
Middletown HS	0.19	0.22	0.04	0.18
Tuscarora HS	0.20	0.14	0.03	0.14
Urbana HS	0.22	0.11	0.07	0.21
Walkersville HS	0.20	0.13	0.01	0.16
Countywide Average	0.182	0.129	0.021	0.147

Countywide Average All Schools	0.543	0.474	0.092	0.461
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**Frederick County Public Schools Pupils Per Household
(As of Fall 2005)**

ELEMENTARY SCHOOL	Single-Family Detached + Mobile Homes	Two-Family Duplex or Townhouse	Multi- Family	Totals
Ballenger Creek ES	0.35	0.21	0.06	0.21
Brunswick ES	0.21	0.21	0.06	0.19
Carroll Manor ES	0.27	0.24	0.05	0.29
Centerville ES	0.47	0.28	0.05	0.43
Deer Crossing ES	0.32	0.19	0.06	0.30
Emmitsburg ES	0.19	0.23	0.04	0.16
Glade ES	0.26	0.35	0.03	0.26
Green Valley ES	0.27	0.24	0.05	0.27
Hillcrest ES	0.16	0.41	0.07	0.20
Kemptown ES	0.31	0.24	0.05	0.31
Lewistown ES	0.15	0.24	0.05	0.17
Liberty ES	0.19	0.24	0.05	0.18
Middletown ES	0.24	0.11	0.03	0.22
Monocacy ES	0.34	0.34	0.11	0.29
Myersville ES	0.21	0.21	0.04	0.21
New Market ES	0.27	0.35	0.05	0.28
New Midway/Woodsboro ES	0.18	0.17	0.10	0.18
North Frederick ES	0.23	0.10	0.04	0.13
Oakdale ES	0.29	0.17	0.05	0.28
Orchard Grove ES	0.37	0.28	0.04	0.25
Parkway ES	0.22	0.12	0.03	0.12
Sabillasville ES	0.12	0.27	0.05	0.13
South Frederick ES	0.08	0.15	0.05	0.09
Spring Ridge ES	0.23	0.23	0.01	0.16
Thurmont ES	0.23	0.32	0.04	0.21
Thurmont PS	0.23	0.32	0.04	0.21
Thurmont ES and PS Total	0.23	0.32	0.04	0.22
Tuscarora ES	0.26	0.24	0.05	0.23
Twin Ridge ES	0.33	0.16	0.08	0.30
Urbana ES	0.24	0.47	0.05	0.26
Valley ES	0.23	0.27	0.03	0.22
Walkersville ES	0.19	0.24	0.01	0.18
Waverly ES	0.19	0.18	0.17	0.18
Whittier ES	0.37	0.35	0.04	0.27
Wolfsville ES	0.17	0.24	0.05	0.17
Yellow Spring ES	0.22	0.24	0.05	0.25
TOTAL	0.24	0.24	0.05	0.21

MIDDLE SCHOOL				
Ballenger Creek MS	0.17	0.13	0.02	0.13
Brunswick MS	0.13	0.12	0.02	0.12
Crestwood MS	0.13	0.10	0.02	0.09
Governor Thomas Johnson MS	0.12	0.07	0.01	0.07
Middletown MS	0.14	0.11	0.02	0.13
Monocacy MS	0.11	0.14	0.04	0.10
New Market MS	0.15	0.06	0.02	0.14
Oakdale MS	0.16	0.16	0.04	0.16
Thurmont MS	0.10	0.08	0.01	0.09
Walkersville MS	0.14	0.11	0.01	0.12
West Frederick MS	0.13	0.10	0.01	0.08
Windsor Knolls MS	0.15	0.08	0.02	0.15
TOTAL	0.13	0.10	0.02	0.11

HIGH SCHOOL				
Brunswick HS	0.18	0.14	0.03	0.16
Catoctin HS	0.14	0.17	0.02	0.13
Frederick HS	0.17	0.13	0.02	0.11
Governor Thomas Johnson HS	0.16	0.12	0.02	0.12
Linganore HS	0.21	0.10	0.02	0.19
Middletown HS	0.18	0.23	0.04	0.18
Tuscarora HS	0.21	0.13	0.03	0.14
Urbana HS	0.22	0.11	0.02	0.21
Walkersville HS	0.20	0.15	0.01	0.17
TOTAL	0.18	0.13	0.02	0.15

COUNTY TOTALS	0.56	0.47	0.09	0.48
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STUDENT INFORMATION CARD

YOUR STUDENT

Student's Name _____
Last First MI

Home Phone _____ Birthdate _____ Sex _____ Grade _____

Street Address _____

City _____ Zip Code _____

What kind of dwelling do you live in? ☐ Single-family detached home or mobile home ☐ Townhouse or duplex ☐ Apartment or condo

Mailing Address (*if different than above*) _____ Zip Code _____